Claims

I claim:

1. A method for detecting components of a non-stationary signal, comprising:

acquiring the non-stationary signal;

constructing a non-negative matrix of the non-stationary signal, the matrix including columns representing features of the non-stationary signal at different instances in time; and

factoring the non-negative matrix into characteristic profiles and temporal profiles.

2. The method of claim 1 in which the non-negative matrix has M temporally ordered columns where M is a total number of histogram bins into which the features are accumulated, such that $M = (L/2+1)$, for a signal of length L.

4. The method of claim 3 in which the non-negative matrix is expressed as $\mathrm{R}^{M\times N}$, the temporal profiles are expressed as $\mathrm{R}^{M\times R}$ and the characteristic profiles are expressed as $\mathrm{R}^{R\times N}$, where $R \leq M$, where R is a number of components to be detected.

5. The method of claim 1 in which the non-stationary signal is an acoustic signal.

6. The method of claim 1 in which the non-stationary signal is a 2D visual signal.

7. The method of claim 1 in which the non-stationary signal is a 3D-scanned signal and frames of the signal represent volumes.

8. The method of claim 4 in which the number of components R is known.

9. The method of claim 4 in which the number of components R is an estimate number of components.